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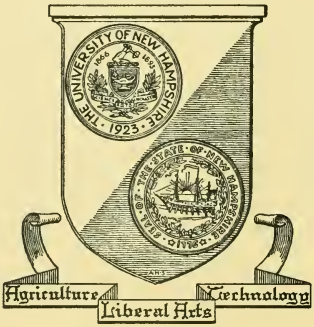

The University
of
New Hampshire

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MARKETING NEW HAMPSHIRE POTATOES

by

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AGRICULTURAL EXPERIMENT STATION

DURHAM, NEW HAMPSHIRE

SUMMARY

1. The New Hampshire potato industry is not only declining but also is facing increased competition from Maine.

2. Wholesalers service the major portion of the more densely populated areas and procure supplies on the basis of (1) regularity of supply through the year, (2) large shipments, (3) quality and grade guarantees, and (4) lower price.

3. Lower prices at the farm, reliable grading, and appearance are found in Maine potatoes, the chief out-of-state source of supply.

4. The smaller producers appear to be the least concerned about grade and pack and their produce provides a large proportion of local potatoes marketed at digging time.

5. The higher support prices in New Hampshire and increased salesmanship of Maine growers have resulted in (1) the withholding of New Hampshire-produced potatoes from local markets and (2) increased competition from Maine producers on the larger New Hampshire markets.

6. Because of increased competition for markets in the light of declining consumption it is proposed that New Hampshire potato producers form regional storage and marketing centers to obtain uniformity of grade and pack, and regularity of supply, in order to re-establish declining trade outlets.

Marketing New Hampshire Potatoes

By J. R. Bowring

Associate Agricultural Economist

INTRODUCTION

This bulletin attempts to bring up to date trends in the production and marketing of New Hampshire potatoes. We hope that the information in it will help to make producers and administrators more aware of the problems they are now facing and will confront in the future.

REVIEW OF LITERATURE

Previous studies in New Hampshire[1] have surveyed the problems facing producers and recommendations have been made accordingly. Woodworth, *et al*, showed the large imports into New Hampshire markets from Maine and Boston and indicated that the price advantage in local markets was an inducement for an expanded acreage and income from potatoes by New Hampshire producers. In 1931, Rinear indicated that the majority of consumers either preferred New Hampshire potatoes or had no choice as to their source, provided that their quality and size were satisfactory. This indication was a further challenge to New Hampshire producers to take advantage of the market opportunities. In 1933, Rinear and Abell showed that freight rates were favorable to the New Hampshire producers for increased sales in southern New Hampshire and Massachusetts. Local prices were consistently higher than Boston prices but handlers had the following criticisms, some of which, a recent survey discloses, still exist:

1. Local growers are not a steady source of supply; middlemen find it more profitable to purchase from sources offering even supplies.
2. The price of local potatoes is too high in comparison with supplies from Maine.
3. Local growers frequently sell at the same price to wholesalers and retailers in the same town.
4. Packages are not uniform as to shape and weight.
5. Standard grades are not always complied with.

Numerous studies on consumer preferences and marketing practices have been made throughout the United States.[2] They emphasize the in-

[1]H. C. Woodworth, *et el, Can New Hampshire Produce More of What She Eats?* (N. H. Agricutlural Experiment Station Bulletin 222, June 1946), p. 12

E. H. Rinear, *Consumer Preference for Potatoes* (N. H. Agricultural Experiment Station Circular 37, June 1931)

M. F. Abell and E. H. Rinear, *Marketing Pototoes in New Hampshire* (N. H. Agricultural Station Circular 42, June 1933)

[2]The following is a selection from available publications:

a. F. E. Scott, *et el, Problems in Marketing Potatoes* (U. S. Department of Agriculture, Bureau of Agricultural Economics, July 1949)

b. *Potato Preferences Among Household Consumers* (U. S. Department of Agriculture. Misc. Publication 667)

c. Rose and Cook, *Handling, Storage, Transportation, and Utilization of Potatoes* (U. S. Department of Agriculture Bibliographical Bulletin 11, 1949)

d. *Potatoes in Hotels and Restaurants* (U. S. Department of Agriculture, AIS 81, 1949)

e. *New Hampshire Potato Branding Law* (N. H. Bureau of Markets, Concord, N. H., July 1, 1949)

creased competition in quality, size, and packages and offer valuable advice on grading and handling of potatoes in order to meet the growing refinements in marketing practices.

PRODUCTION IN NEW HAMPSHIRE

The proportion of New Hampshire farm income derived from potatoes has declined from an approximate 4 per cent in 1924 to less than 2 per cent in 1948. Acreage in potatoes declined from 1930 to 1940, increased somewhat by 1945 due to war-time expansion programs, then declined rapidly to an estimated 3800 acres in 1950.

Table 1. Potato Acreage for 1930, 1940, and 1945 in New Hampshire by Counties[1]

County	1930	1940	1945	1949	1950
Belknap	481	376	543		
Carroll	366	256	362		
Cheshire	347	420	623		
Coos	1427	1126	1122		
Grafton	1060	890	943		
Hillsborough	570	599	733		
Merrimack	958	695	591		
Rockingham	993	941	1199		
Strafford	443	448	550		
Sullivan	534	401	445		
Total	7179	6152	7111	4300[2]	3800[3]

[1] *Agricultural Census*, (U. S. Census Bureau.)

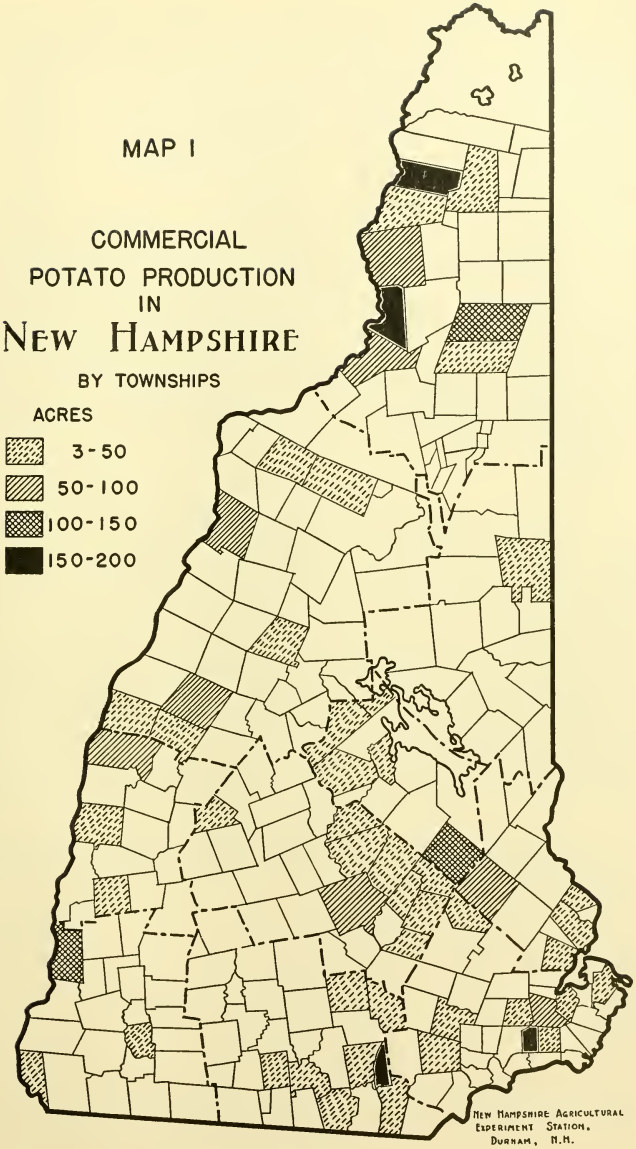
[2] *Crop Production* (U. S. Department of Agriculture Annual Summary, 1949), p. 92.

[3] *Acreage for Harvest* (Crop Production, July 1, 1950, U. S. Department of Agriculture), p. 71.

Yields per acre for the state in 1949 averaged 225 bushels per acre as compared with 160 bushels per acre for the 1938-47 period. The total acreage as here compiled includes both growers who produce for home use and those who produce for sale.

Assuming that commercial growers have three or more acres planted to potatoes, the acreage devoted to potatoes for trade and off-farm consumption is greatly reduced from the total. For purposes of market analysis, attention will be directed only to those potatoes moving in trade. In 1949, such acreage was 2384 with an estimated production of 820,000 bushels. The location of this acreage is indicated on Map No. 1 and Table 2.

Between counties there are certain interesting trends. In the northern part of New Hampshire, Coos and Merrimack Counties have shown the greatest acreage decline since 1930, while in the southern sections of the state, increases are apparent in Cheshire, Hillsborough, and Rockingham Counties.


MAP I
COMMERCIAL
POTATO PRODUCTION
IN
NEW HAMPSHIRE
BY TOWNSHIPS
ACRES
3-50
50-100
100-150
150-200
NEW HAMPSHIRE AGRICULTURAL
EXPERIMENT STATION,
DURHAM, N.H.

1949

Table 2. 1949 Commercial Potato Acreage by Counties in New Hampshire

County	Acres	County	Acres
Belknap	176.9	Hillsborough	357.7
Carroll	41.0	Merrimack	185.6
Cheshire	164.4	Rockingham	439.5
Coos	590.4	Strafford	80.1
Grafton	243.1	Sullivan	105.7
Total			2384.4

Production is not evenly distributed through the various towns, and 71 per cent of the 1949 crop was produced in 51 towns and the remainder in 183 towns.

The commercial acreage for 1949 showed 93 farms planting 3 to 10 acres, 31 farms planting 10 to 25 acres, and 25 farms planting over 25 acres.

The acreage of certified seed potatoes in 1949 by varieties is as follows:

Green Mountains 60
Katahdin 7
Others ..... 36, a small proportion of the total acreage.

In relation to production in other New England states, New Hampshire is overshadowed by the commercial supplies from Maine. It is inevitable, therefore, that the marketing practices and pricing of Maine potatoes must reflect on the potato industry in New Hampshire. The relation of New Hampshire to the rest of New England in terms of density of production is shown in Map No. 2[1]. See page 8.

The proportion of the crop moving in interregional trade will be related to the excess of production over local requirements. With population much greater in the southern New England states, there is what we might call a gravitational pull away from the more sparsely populated northern potato-producing areas to the south. Maine potatoes are attracted to New Hampshire markets and approximately 12 per cent of the New Hampshire commercial potato crop is attracted to neighboring Massachusetts markets.

VARIETIES[2]

Green Mountain was the most popular variety grown by a sample of 72 New Hampshire potato growers. The frequency of different varieties is given below:

Variety	Number of Growers	Variety	Number of Growers
Green Mountain	50	Irish Cobbler	9
Katahdin	2	Sebago	7
Houmas	9	Mohawk	1
Chippewa	9	Ontario	1

[1]This can be interpreted only as a county guide and does not indicate the distribution within counties.
[2]See *Potato Growing in New Hampshire* (N. H. Agricultural Extension Bulletin 45, reissued 1943.)

Of the 20 highest yields in the 300 bushel club[1], the following varieties were grown:

Variety	Number of Growers
Green Mountain	9
Katahdin	7
Chippewa	2
Ontario	1

There appears to be some disagreement as to the relation of cooking quality and market appeal of varieties. According to a consumer survey of qualities desired[2], mealiness was a predominant characteristic. Experiments with the specific gravity test as a measure of mealiness indicated Green Mountain to be superior to other varieties[3]. The shape, color, and evenness of quality have given Katahdins certain market advantages, which, together with resistance to leaf roll and net necrosis, have encouraged increased production in commercial areas. The average consumer is not sufficiently familiar with potato varieties to differentiate between them in the buying. A survey of retailers in the state, however, did indicate a consumer preference for Green Mountain potatoes when they had become accustomed to their use.

MARKETS IN NEW HAMPSHIRE

The commercial outlets for potatoes in New Hampshire are: retail at the farm; direct sale to retail stores and institutions, wholesalers, jobbers, and chip factories. The adopted method depends upon trade connections, the size of the crop, and relative prices.

The smaller acreage farms sell primarily at local stores or direct to consumers. As the quantity produced increases, the wholesale jobbers, chain stores, and chip factories become more important as outlets.

In 1931, a few Merrimack County growers decided to co-ordinate their sales to Cloverdale Stores. The State Farm Bureau furnished financial assistance. Growers from all over the state became interested in this co-operative movement and, in 1932, the Agricultural Services Inc., of the Farm Bureau was organized. The function of this new agency was to act as commission agent between growers and chain stores and state institutions, but was not to handle or store the potatoes. Although there was no trade guarantee, the buyer's ability to procure potatoes from one agent, representing the growers, was of great assistance to their procurement activities.

The Agricultural Services Inc., adopted the U. S. grade standards for its sales and has used a two-inch minimum for the last eight years.

Here was an attempt to provide local markets for growers, to reduce haulage distance, and to meet the competition from Maine, which previously was the chief source of supply for the chain stores.

The original membership was approximately 150 growers, but with the decline in the number of growers in the state, the membership now stands

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[1] *1949 Annual Summary* (Department of Agronomy, University of New Hampshire)

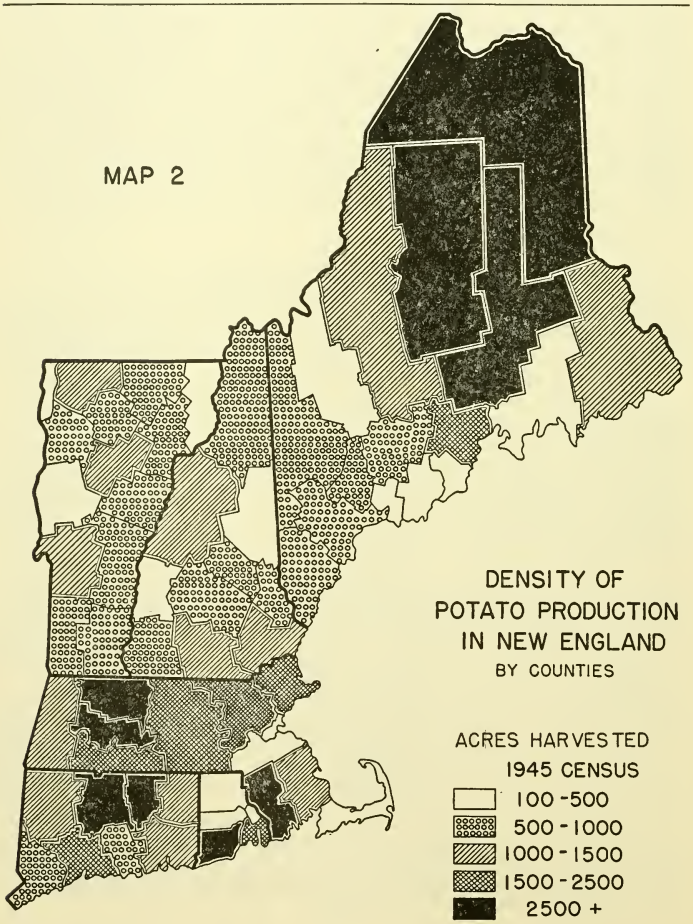
[2] E. H. Rinear, *Consumer Preferences for Potatoes* (N. H. Agricultural Experiment Station Circular 37, 1931).

[3] P. T. Blood and J. L. Haddock, *(Variations in Cooking Qualities of Potatoes as Influences by Varieties) (American Potato Journal 16 (5))*, pp. 126-134.

close to 40. The acreage of these producers and the yields have increased to a point where the quantity of potatoes handled is greater than the reduced number of growers would imply.

Other outlets to independent and chain stores are provided by the Merrimack Farmers Exchange, various fruit and produce companies, and jobbers.

In New Hampshire, there are 30 towns or cities with populations from 2,000 to 5,000 and 15 with populations of over 5,000. The influx of summer visitors occurs during the months when few locally grown potatoes are available. Local supplies are brought to markets mainly by truck. A large



proportion of the Maine potato imports move by train. The carlot shipments for selected years is given in Table 3:

Table 3. Carload Shipments of Maine Potatoes to New Hampshire[1]

1927-28	1929-30	1943-44	1945-46	1946-47	1947-48	1948-49	1949-50
357	465	513	440	286	229	227[2]	392[3]

[1]Maine potatoes — U. S. Department of Agriculture and Maine Division of Markets.
[2]104 carloads for feed.
[3]269 carloads for feed.

Two factors must be considered in the interpretation of this table. Government diversions for relief and dehydration began in 1943. By 1946 government procurement for livestock feed had commenced, thus reducing the proportion of table stock in the rail movement.

The second factor is the increased use of trucks replacing rail shipments to the New England markets. For example, in 1944-46 there were 1400 carlot equivalents shipped from Maine to all markets by truck. By 1948-49 there were 4122 carlot equivalents shipped by truck, while shipments in 1949-50 amounted to 6200 carlot equivalents.

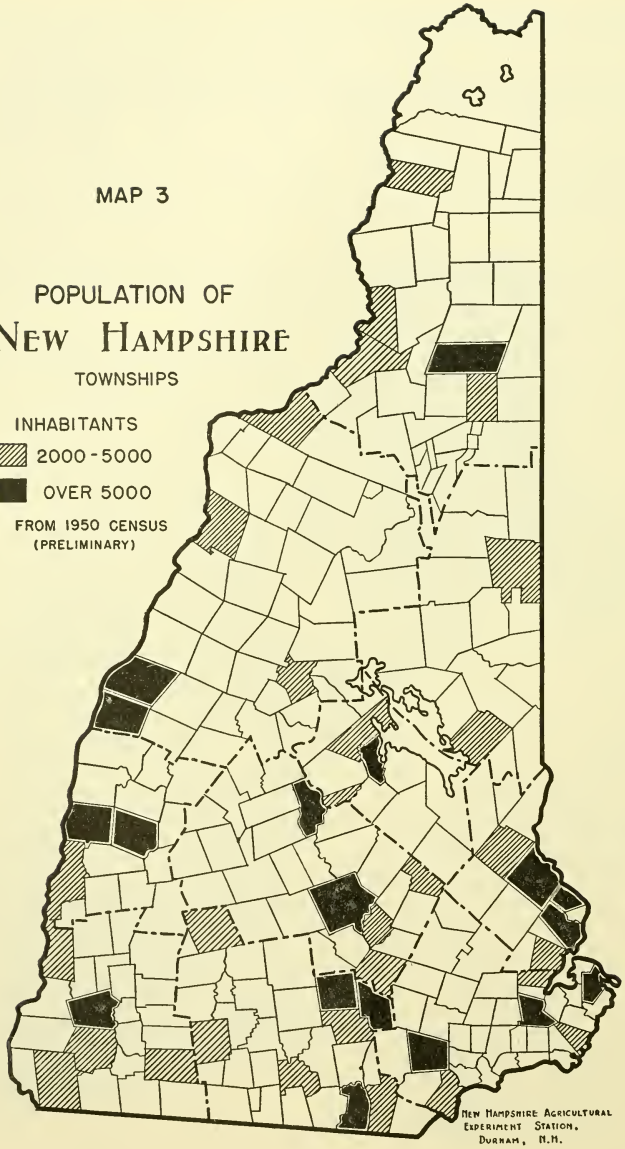
The imports from Canada to 100 cities in the United States, by rail and boat, was 6731 carlot equivalents in 1949. Of this amount 362 carlots were shipped to Boston, as compared with 2683 carlots from Maine. Other Canadian shipments were made by truck and rail to small cities. No estimate is available of the amount which found its way into New Hampshire markets. Many wholesalers handle Prince Edward Island potatoes to add variety to their trade offerings. These potatoes are sold at a premium in many stores.

On the basis of interviews with retailers, Map No. 4 delineates those areas supplied predominantly by out-of-state potatoes and those by local supplies. The wholesalers handle those potatoes which will satisfy their customers as to grade and quality and give them the greatest return over cost. Unit costs can be minimized by bulk purchases, and preference is frequently given by wholesalers to that type of supply. This eliminates the independent small grower and forces him to deal directly with consumers or retailers. See page 12 for Map 4.

Of 172 retailers interviewed, 86 received supplies exclusively from wholesalers and 10 from producers only. The remainder handled supplies from both sources. The reasons given by retailers for their preference of wholesale supplies were: (1) convenience of regular delivery, (2) lack of storage space[4], and (3) past selling difficulties with local supplies. The complaints against local supplies heard most frequently were: (1) poorly packed and graded, (2) quality variation within packs, and (3) prices too high. When asked whether or not they would anticipate greater sales with lower prices, 81 retailers said yes and 57 said no.

An undoubted preference by customers for New Hampshire potatoes was expressed by northern and western retailers. Their availability appeared to be a controlling influence on preference in the east central areas of the state which are predominately vacation towns and depend upon wholesalers for supplies irrespective of variety or source.

[4]Four only out of 172 had adequate potato storage space.


MAP 3
POPULATION OF
NEW HAMPSHIRE
TOWNSHIPS
INHABITANTS
2000 - 5000
OVER 5000
FROM 1950 CENSUS
(PRELIMINARY)
NEW HAMPSHIRE AGRICULTURAL
EXPERIMENT STATION,
DURHAM, N.H.

LOCATION OF PRODUCTION

The location of potato production will be based upon: (1) availability of physical factors of production, such as soil, climate, and land ownership[1], (2) the location and size of markets, (3) the cost of transportation, and (4) established trade contacts.

The price at which potatoes can be produced must be at least equal to the market price less cost of transportation. If transportation charges should rise without a similar increase in market price, to the extent that producers fail to reduce costs of production, it will be more difficult for them to stay in that market.

Similarly, if one producer is given a lower transportation rate than another, he will be able to undersell his competitor and take away some, if not all, the market. Given equal production costs, this will force the one producer to look elsewhere for markets or to retire from production.

The relative costs of transportation between areas which supply New Hampshire markets must be considered when measuring their competitive advantage. With this in mind, the carlot rates from typical shipping points in Maine and New Hampshire are compared in Table 4. The markets chosen are four of the larger markets in the southern part of the state for which subsequent price data are discussed.

Table 4. Carlot Freight Rates per 100 Pounds of Potatoes[2]

From	Destination			
	Manchester	Concord	Keene	Portsmouth
NEW HAMPSHIRE				
Berlin	$.44	$.43	$.43	$.42
Lancaster	.43	.42	.42	.42
Colebrook	.47	.44	.46	.44
MAINE				
Dover-Foxcroft	.33	.34	.39	.30
Houlton	.40	.40	.48	.40
Presque Isle	.47	.47	.55	.47

Under the present rate structure, it costs less per mile to ship from Presque Isle, Maine to Manchester, New Hampshire than it does from Colebrook, New Hampshire[3]. Potatoes shipped from Dover-Foxcroft, Maine, to Manchester cost 14 cents less per hundred than potatoes shipped from Colebrook.

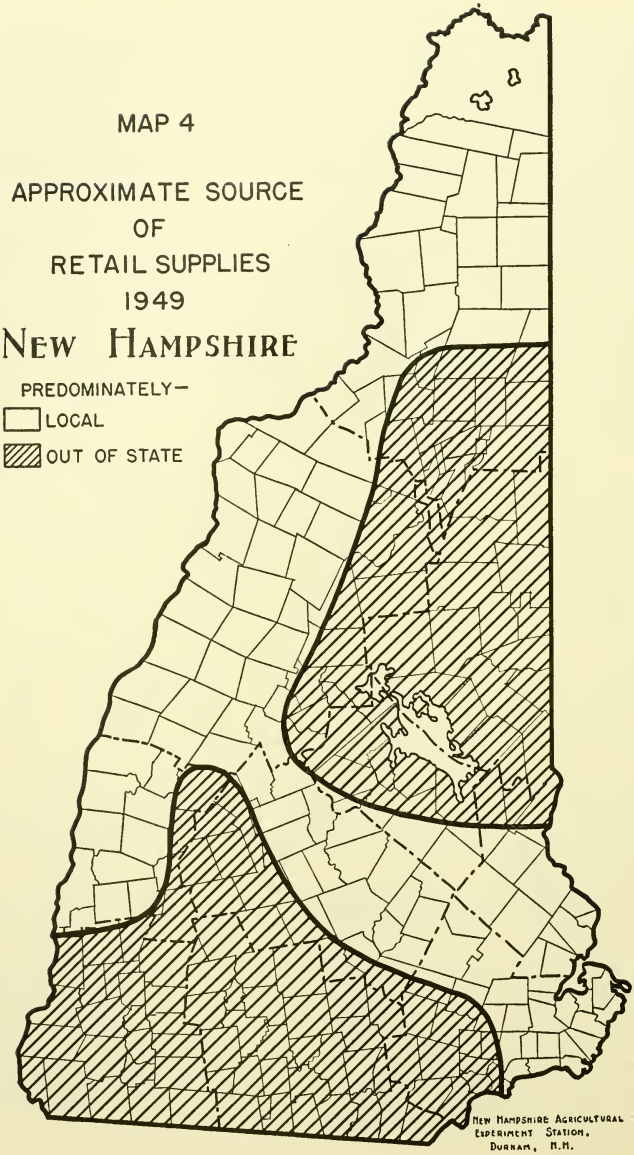
New Hampshire producers receive some protection on the Keene market by reason of a zonal increase in rates from Maine relative to northern New Hampshire.

The implications of these rate differentials to the location of production in New Hampshire are that: (1) Northern New Hampshire producers are at a disadvantage in competition with Maine growers on the larger state

[1]This will be taken up in a another bulletin on potato-production problems.

[2]Additional heater charge of $2.65 per day for refrigerator cars in New Hampshire. The charge for Maine potatoes is $10.00 per car irrespective of time.

[3]For example, Presque Isle to Manchester, approximately 382 miles at $.47 equals $.123 per mile and Colebrook to Manchester, 180 miles at $.47 equals $.261 per mile, more than twice as much. The comparable rates for 1933 were Colebrook to Manchester $.23, and Presque Isle to Manchester $.395, showing recent rate changes have worked to the disadvantage of Colebrook producers.


MAP 4
APPROXIMATE SOURCE
OF
RETAIL SUPPLIES
1949
NEW HAMPSHIRE
PREDOMINATELY—
LOCAL
OUT OF STATE
NEW HAMPSHIRE AGRICULTURAL
EXPERIMENT STATION.
DURHAM, N.H.

markets; (2) producers in the Keene area have a certain competitive advantage over Maine producers which is not present in the other New Hmpshire markets.

The increased use of trucks for shipment from northern areas to these markets tends to reduce the significance of the rate differentials shown on Table 4. However, any attempts of New Hampshire producers to make greater use of rail movement should take these rates into consideration.

The truck rates given in Table 5 for comparable markets and sources show a greater relationship between distance and cost.

Table 5. Truck Rates per 100 Pounds for Potato Shipments, 1950 (minimum weight 20,000 pounds)

From	Destination			
	Manchester	Concord	Keene	Portsmouth
NEW HAMPSHIRE[1]				
Berlin	$.44	$.41	$.51	$.42
Lancaster	.42	.39	.47	.44
Colebrook	.50	.47	.54	.53
MAINE[2]				
Dover-Foxcroft	.61	.60	.69	.30
Houlton	.82	.81	.93	.75
Presque Isle	.96	.93	1.06	.87

[1]Class rates, New Hampshire Motor Rate Bureau. Smaller carriers may ship at lower rates. Contract carriers are not required to file rates. Individual agreements are possible at less than these rates.

[2]Class V rates, Interstate Commerce Act. Vehicles used exclusively for transportation of unprocessed agricultural commodities are exempted from operation of this Act.

With these transportation charges in mind, the question of relative prices will be discussed.

RELATIVE PRICES

The major wholesale market in New England is in Boston and most local sales are based on quoted Boston prices. The relation between the price to producers at the Boston market and at various New Hampshire markets showed a past price advantage to the local markets.

A 10-year average (1938-49) of prices paid producers in October and March at four New Hampshire markets and at Boston shows the percentage advantage over Boston prices to be as noted on Table 6.

Table 6. Per cent Wholesale Price Difference Between Boston and Four New Hampshire Markets for the Period 1938-49.

Market	October	March
Manchester	+5	+8
Concord	+5	+8
Keene	+10	+12
Portsmouth	+15	+11

For potatoes to move from one market to another, the price difference in the two markets must be greater than the cost of transportation before it will pay to ship them.

As there has been some recent change in these price differences, a comparison of Boston wholesale prices with certain local New Hampshire wholesale prices for the 1949 crop year, August to May 1950, shows the relationships designated on Table 7.

Table 7. Comparison of Freight Costs with Boston and New Hampshire Wholesale Price Differences, 1949-50.

Market	Average wholesale price per cwt.[1]	Difference from Boston	Carlot rates per cwt. from Boston	
Boston	238			
Manchester	234	—4	29	
Concord	249	+11	32	
Keene	279	+41	33	35[2]
Portsmouth	265	+27	29	24[2]

[1]The price quotations of the N. H. Department of Agriculture and the methods of price quotation used are not questioned, although there may be grounds for error here.

[2]Truck rate.

Using carlot freight rates as transportation costs, it was not generally profitable to rail-ship potatoes from Boston to Manchester or Concord. As Portsmouth was on the borderline, doubtless there were days when it paid to ship potatoes from Boston by rail, and certainly by truck. Keene had a definite advantage, and it was profitable for Keene district wholesalers to buy in the Boston market. This observation probably holds true for district 4 on Map No. 5, which shows five major price zones on the New Hampshire wholesale markets.

The pressure on wholesalers to buy in this way will increase as Boston prices decrease or greater supplies of Maine potatoes are shipped to that market. The local producers can compete under these conditions by providing equal or better quality potatoes at the same or lower price than Boston wholesale potatoes can be brought to New Hampshire markets.

With Maine potatoes selling at $1.90 per hundredweight, the transportation to Boston at $.47 and from Boston to Keene at $.33, they could be laid down in Keene at $2.70, which is about the average price at wholesale for 1949. The same potatoes can be shipped from Presque Isle to Boston and from Boston to Portsmouth at $2.66, which is the average price for 1949 in that market.

If the Maine potatoes at $1.90 were shipped by rail direct from Presque Isle to Keene, they could be sold at $2.45, or to Portsmouth at $2.37. Colebrook potatoes at $2.15[3] could be shipped by rail to Keene at $2.61 or by truck at $2.69, and to Portsmouth at $2.59 and $2.68, *both in excess of the delivered Maine potato prices.*

The sum total of these comparisons is that Maine potatoes can be profitably delivered and sold on New Hampshire markets. Considering the distance which these potatoes must travel and the consequent transportation and handling charges over and above the farm price, we may question why potatoes that are produced closer to the markets should not maintain a certain monopoly position based upon their locational advantage alone.

[3]A support price differential of $.25 existed in December 1949. See following section.

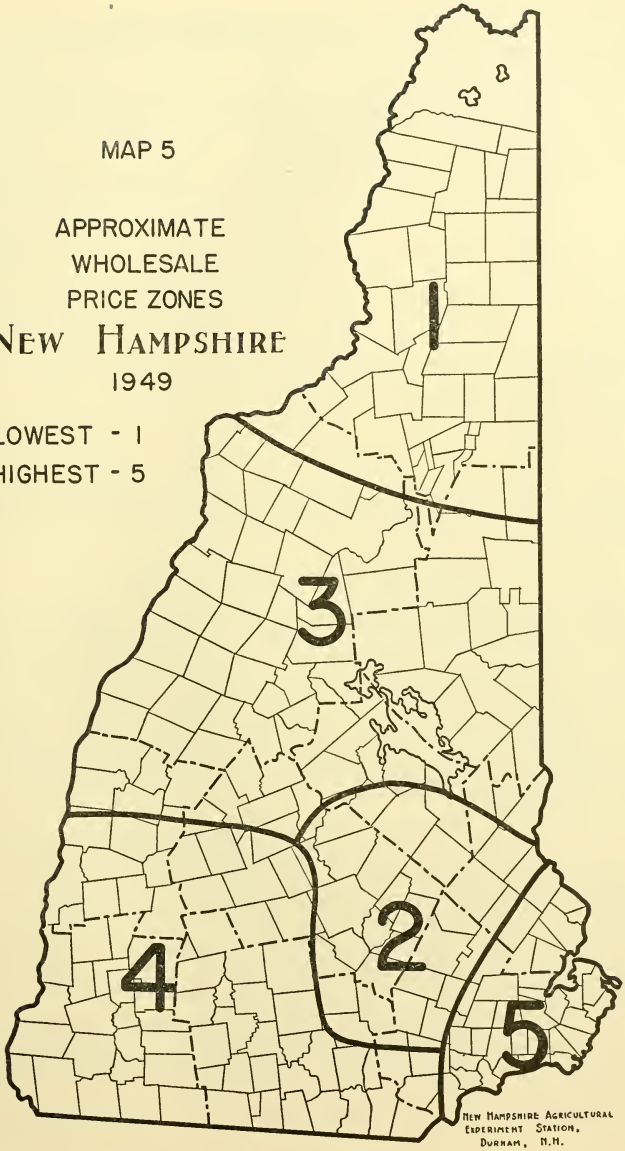
MAP 5

APPROXIMATE
WHOLESALE
PRICE ZONES

NEW HAMPSHIRE

1949

LOWEST - 1
HIGHEST - 5



The answer may partially be accounted for by a lower Maine farm price, a well-graded product, and a steady supply through the greater part of the year, conditions which are not met by local producers who are interested in selling on these markets.

There may be additional institutional reasons, such as wholesale preference for Maine potatoes or trade agreements between handlers, which have not been explored, but which influence the source of supply. Local producers are not supplying these markets.

Price quotations used as the basis for sales are influenced by the Boston market. The quotations used by a sample of growers are given on Table 8.

Table 8. Potato Price Quotations Used by a Sample of New Hampshire Growers

Size of acreage	No.	Presque Isle news sheet	Boston radio or papers	N. H. Market Bulletin	Trade	Other Growers
Over 20	11	2	7	1	1	
10 to 20	5		4		1	
5 to 10	7		2	3	1	1
Less than 5	25		5	13	3	4

The larger growers used the Boston wholesale price more extensively and the small growers, to a greater extent, used the New Hampshire Market Bulletin which reflects local sales.

GOVERNMENT PRICE SUPPORT PROGRAM

Wartime food needs called for increased production of potatoes. The Congress enacted legislation which by government procurement programs would protect producers of perishable or non-storable commodities from losses due to increased production. While total government procurement in the United States reached as high as 105 million bushels in 1946, the New Hampshire share was 205,000 bushels in 1946 and, in 1949, 504,563.

A support price announcement is the price at which the Federal Government purchasing agency will take delivery. Their final use is decided upon by the government. The market price will tend to be equal to or exceed the announced price[1].

The proximity of Maine supplies and the announced price in Maine influenced the supplies moving into New Hampshire markets. In 1949-50 New Hampshire and Maine support prices were as shown on Table 9.

This meant that if the support price were the same as the market price, dealers in New Hampshire could buy supplies cheaper from Maine producers than they could from New Hampshire producers at an equal distance. This condition was exemplified on the Berlin market and there was incentive for local producers to sell to the higher priced market, which was the Federal Government.

The higher support price level in New Hampshire combined with favorable freight rates from Maine has tended (1) to withhold potatoes which are locally produced from New Hampshire markets and (2) to in-

[1]One exception is noted in Presque Isle, Maine, for January, February, 1949 when the sale price was consistently below the support price.

Table 9. Government Support Price Levels for New Hampshire and Maine, 1949-50. Sacked, graded, f.o.b., cwt.

Month	Maine	New Hampshire
September	$1.55	$1.80
October	1.55	1.80
November	1.70	1.95
December	1.90	2.15
January	2.10	2.35
February	2.15	2.40
March	2.20	2.45
April	2.20	2.45

crease the competitive advantage of Maine producers. The large proportion of potatoes handled by wholesalers has enabled them to take advantage both of carlot rates and a lower priced source of supply. To this extent, local market outlets were disrupted, and their renewal will depend more than ever upon future merchandising practices and price and quality competition with Maine.

The continuation of price support for potatoes in 1950 is to be related to the production control programs adopted. A method of controlling supplies of perishables is by marketing agreements and orders. Under this system a committee representing producers in a state or region develops a policy for marketing potatoes with due consideration for consumer demand, grades, and price. On the basis of this committee's recommendations, the U. S. Secretary of Agriculture may then regulate the shipment of particular grades, sizes, or qualities of any or all varieties of potatoes. He may also regulate the shipment of potatoes by establishing minimum standards of quality and maturity.

In order to safeguard these regulations, all potatoes shipped[1] must be inspected by an authorized representative of the Federal State Inspection Service or such other inspection service as the Secretary of Agriculture shall designate. Permission to ship potatoes for seed, export, manufacture, feed, or other purposes under this agreement may be obtained at the discretion of the Secretary or his representative. By these measures the quantity and grade of potatoes maarketed can be controlled to prevent oversupply and to reduce the need for government price support.

The necessity for inspection before sale as an attempt to improve grades is an additional check on the quantity sold by each grower. The amount of inspection needed will depend upon the quantity of potatoes and the time of sale. If small amounts are sold through the year, the inspection service will be busy. If the major sales are made at digging time, then inspection service must be sufficiently large to cover the region in a short space of time. The cost of such regulations to the state or region should be related to the benefits to be gained by producers and consumers irrespective of whether or not there is government price support and procurement. The marketing agreements and orders are means at the disposal of producers

[1]"to transport, sell, or in any other way to place potatoes in the current of commerce within the production area or between the production area and any point outside thereof." *Agricultural Marketing Agreement Act, 1937.*

for regulating supplies to prevent overloading of markets, to maintain quality, and, in turn, to retain some control over the price. A marketing agreement is feasible to the extent that producers wish to co-operate for these ends. It is unfortunate that consideration of marketing agreements should be conditioned on the participation or nonparticipation in price support programs.[1] Decisions made under these conditions are not apt to be made on the merits of agreements as such.

If consumers and handlers are to indentify New Hampshire potatoes and demand them, the uniformity of grades and quality will then be a worthwhile objective. Considering the location of producers in the state and assuming the desire of individual producers to maintain their identity as growers, then state-wide control through a marketing agreement may have limited benefits. If one objective of agreements is to control supply, (because New Hampshire receives supplies from Maine, Idaho, and Boston in addition to local production) such an objective would be uneconomic. The only apparent benefit would be the improvement in quality of the potatoes marketed through more rigid inspection. This would provide greater competition for imported potatoes, thus diverting more income to local growers and supplementing any state grading system in force.

One thing is clear; the adoption of uniform market procedures must be the result of voluntary producer co-operation, which means that benefits must be apparent in terms of increased incomes to growers.

CONSUMPTION

Increased Competition

The consumption of potatoes in the United States has been declining steadily since the turn of the century. From an estimated 195 pounds per person per year in 1910, it shrank to 108 pounds in 1948. Production, on the other hand, has shown no comparable change. This is chiefly due to an increased yield per acre on reduced acreage, grown by specialized commercial growers.

A continued supply in the face of a reduced demand must lead to decreased returns per bushel produced and a readjustment of production, unless artificial price stimulus is offered by the Federal Government.

Competition for the sale of potatoes has increased the adoption of methods for increasing sales. Grading is one such method, as are washing, brushing, packing in standard bags, and the use of attractive displays. Great attention has been to give the merchandising features of potato sales and to the catering to consumer preferences. Many methods, short of reducing price, have been tried to attract consumers to the value of potatoes as a nutritious, economic food, without an apparent increase in consumption.

As the result of consumer surveys in the United States,[2] the following are some of the preferences:

(1) Potatoes of medium size.

(2) Potatoes that are white and mealy, will hold their shape, and will not get watery or soggy when cooked.

[1]The continued emphasis by The Congress and the U. S. Department of Agriculture that supply controls are necessary if support prices are to be continued serves to emphasize the close relation between marketing agreements and orders and market price manipulation.

[2]*Potato Preference Among Household Consumers* (U. S. Department of Agriculture Misc. Publication 6678, 1948).

(3) Potatoes that are free from decay.

(4) Light skinned potatoes.

(5) Clean potatoes.

Some substitutes for potatoes are macaroni, spaghetti, rice, diced beans and peas, bread, and vegetables. They are used for variety in meals and compete with potatoes as a basic starchy food.

Institutions are an important outlet for potatoes. The results of a survey by the U. S. Bureau of Agricultural Economics[1] indicate the buying practices of their representatives. The most important characteristics demanded for potatoes were freedom from decay, absence of cuts, bruises, or cracks, with the objective to avoid waste after purchase.

Consumer Preference

Naturally the concern of producers and distributors is to halt an apparent downward trend in the consumption of their product. For purposes of assessing the demand in order to adjust production and selling practices it is necessary to make both qualitative and quantitative estimates.

The demand for potatoes is part of a larger demand for vegetables and starchy foods; potato purchases are a function of the rate of substitution between potatoes and these other foods. It is necessary to consider what is happening to the relative prices of competing foods, to eating habits, and to the rate of substitution between starchy foods and meats and other proteins.

Using 1935-39 as the base, Table 10 indicates price changes to February 15, 1950.

Table 10. Retail Food Price Index in 56 Cities in United States[2] February 1950 (1935-39 = 100)

Item	Index
All foods	194.8
Cereal and bakery products	169.0
Meats, poultry, fish	221.6
Dairy products	183.6
Fruits and vegetables	199.1
Fats and oils	133.5
Sugar and sweets	178.0

With the exception of meats prices of fruits and vegetables as a group have risen higher than other food groups. These indexes have not been weighted according to food value or taste of consumers; however, a more detailed break-down of cereal products and vegetables should indicate the price changes relative to potatoes.

[1] *Potato Preferences Among Restaurant and Hotel Buyers* (U. S. Department of Agriculture Misc. Publication 682).

[2] *Retail Food Prices by Cities* (U. S. Department of Labor Statistics, Washington, D. C.) p. 6.

Table 11. Retail Food Price Index in 56 Cities, February 1950 (1935-39 = 100)

Item	Index
Cereals and bakery products	169.0
Wheat flour	187.7
Corn meal	175.8
Rice	92.4
Rolled oats	146.2
Bread, white	163.9
Fruits and vegetables	199.1
Apples	187.7
Bananas	278.3
Beans, green	219.2
Cabbage	169.6
Carrots	184.3
Onions	184.8
Potatoes	195.6
Sweet potatoes	205.5
Canned corn	142.1
Canned peas	114.0
Dried beans	204.3

The retail prices of wheat, flour, bread, and rice have not risen as much as have potatoes. In the vegetable group prices of cabbage, carrots, and onions have advanced less than potatoes, and canned corn and peas have shown the least price increase.

There will be regional differences in relative prices and Tables 10 and 11 in no way indicate that one product is a better buy than another. They indicate what has been happening to potato prices relative to competing foods in the United States, and may be a partial answer as to why potato consumption has been declining.

There are no definite findings, however, that in a given situation consumers would buy more if the price were lower,[1] and it can only be deduced that if equal satisfaction is obtained from two foods, the demand for the lower-priced food will increase relative to the other.

Attempts to increase the sale of potatoes by improved quality is the basis for systems of grading established by the U. S. Department of Agriculture, state departments of agriculture, and producers' organizations. To the extent that the grades in use do not increase sales over what they would be without them the additional cost cannot be justified to producers. The same argument applies to packaging. The adoption of packaging in various-sized containers which are attractively marked is a means of increasing sales. Therefore, the grades must meet consumer requirements, or fail in in their objectives.

Various studies have shown that retail price is not necessarily related to quality or grade [2] but a general practice is followed of charging "what

[1] *Problems in Marketing Potatoes — Preliminary results of some recent research* (U. S. Department of Agriculture, July 1949), p. 51.

[2] Merchant and Woodward, *Quality of Potatoes in Retail Stores in Boston and Maine Markets, 1948* (Maine Agricultural Experiment Station Bulletin 466), p. 48.

Rasmussen and Childress, *Grade Qualities of Potatoes in Retail Stores, New York City 1948* (Preliminary report New York Agricultural Experiment Station, AE 6785).

the traffic will bear."[1] Price varies with the income district, the rate of turnover in the store, and gross sales. Consumers generally buy potatoes in the store where they do other shopping, and quality and price are not as important in their decisions to buy as would be necesssary for an accepted grading system to increase sales. The major decisions on purchases are made at the wholesale level.

The size of the quantity purchased at retail is no doubt related to the degree of discrimination in purchasing. A bag of potatoes at 25 cents is "probably not sufficiently important to induce the average homemaker to spend much time shopping around for potatoes."[2]

NEW HAMPSHIRE GRADES

The strict grading procedure, adopted by Maine potato growers, has meant that Maine potatoes moving on to New Hampshire markets offered severe competition for local products not graded or poorly graded and without extensive quality controls. To assist producers in maintaining or finding new outlets for their produce, the New Hampshire Department of Agriculture established a new potato branding law on July 1, 1949. This law is intended to complement the U. S. Standards for Potatoes as developed by the U. S. Department of Agriculture.

> "The principal provisions of the law are that all shipments, packages, containers, or displays in which potatoes are packed, distributed, sold, offered or exposed for sale are required to have the following markings:
>
> (a) The proper grade ("U. S. Extra No. 1", "U. S. No. 1", "U. S. Commercial", "U. S. No. 2", or "Unclassified", as the case may be).
>
> (b) The name and address of person or persons responsible for grading and packing.
>
> (c) The true net contents as required by the State Weights and Measures Law on open or closed packages."[3]

In spite of the legal penalties for violation of this law, its success in improving the quality of potatoes is dependent upon the degree to which returns to producers are increased by its adoption. It is inevitable that some producers should have different evaluations of the benefits to be gained from grading procedures and their market behavior will follow accordingly. The variation in quality and grade refinements of New Hampshire potatoes will affect their acceptance by trade in comparison with other sources. In the past, handlers have criticized New Hampshire potatoes because of their (1) dirty appearance, (2) variation in size and shape, (3) turning black when cooked, etc. Such complaints, however, have little meaning unless they are related to a specific grower on a specific market. Further investigations showed that the small growers who try to sell at the time of digging are the worst offenders in regard to the quality of pota-

[1]The retail price in June 1050 varied from $.39 to $.69 per peck in a sample of retail prices in the state.

[2]Russell and Childress, *How Mrs. Consumer Buys Potatos in New York City* (Cornell Department of Agricultural Economics), p. 11.

[3]*New Hampshire Potato Branding Law, July 1, 1949* (Bureau of Markets, New Hampshire Department of Agriculture.)

toes. There appeared to be some opposition to grading even up to the U. S. Standards. This may be due in part to lack of outlets for culls and in part because some market will accept their product. The price differential between a carefully graded product and others has not always been sufficiently distinct to offer a permanent reward or margin for increased attention to grades. Established trade outlets for larger growers are undoubtedly based upon quality guarantees over and above the standard grades, which offer sufficient incentives for accurate grading.

The economic advantages of dividing a product into grades must be apparent either in current or expected income before accurate grading can be adopted or justifiably enforced. This is a problem for agricultural extension education.

The sorting table is an accepted means to facilitate accurate grading and to reduce the time involved. The results of a sample survey showing the relation of ownership of a sorting table to size of potato acreage is designated on Table 12.

Table 12. Ownership of Sorting Table and Acreage from Sample of Growers in New Hampshire, 1949.

Acreage	Number interviewed	Percent with sorting table
20+	14	85.8
10 - 19.9	9	88.9
5 - 9.9	9	77.8
3 - 4.9	8	62.5
Under 3	35	25.8

The proportion of the growers who have sorting tables appears to decline with the acreage. If a sorting table is associated with good grading then the observation that the poorer graded potatoes are sold by small growers is strengthened.

Many such growers have limited outlets based on joint sales — for example, squash and potatoes. The dealer will take the potatoes only because he needs the squash. Again, the storekeeper may so value the grower's business that he will accept his potatoes in partial payment of debts. Potatoes which are thus acquired may or may not be graded further by the storekeeper. But the fact remains that during the potato-digging season the market is flooded with such potatoes. Therefore many of the larger growers prefer to hold back supplies until the poorer grades have disappeared, even though the effect on consumer acceptance may not have disappeared. This necessitates the possession of storage capacity and leads to the question of storage and the evening out of market supplies through the year.

STORAGE AND MARKET SUPPLIES

If the potato crop is marketed at the time of digging, a fall in prices can be expected, assuming that there is no government support. The trade must look elsewhere for supplies during the remainder of the year.

New Hampshire is in the late potato zone which means that the bulk of the supplies are available from September through April. The price tends to increase from September to January, then evens off. Hotels, restaurants, and wholesalers can facilitate their procurement activities from a steady source of supply. The storage function must generally rest with the producer or wholesaler and the risk of spoilage is borne by them. The decision whether or not to store is generally related to the kind of trade outlet the producer may have. A wholesaler who has storage capacity may do most of his buying in the fall when prices are relatively low. Some of the larger New Hampshire growers sell their crops to a jobber as they are dug, thus shifting the risk of price changes and spoilage. Other growers have agreements to supply regular amounts during the year and have developed their storage accordingly. To recommend storage as a good marketing practice for producers would be correct only if the net returns from the crop could be increased, which, in turn, will depend upon the cost of storage facilities, market outlets, and changes in price as the season develops. With a small acreage it could well be more economical to sell in the fall and to consolidate the supplies and risk in the hands of experienced wholesalers. If storage facilities are available on the farm and the space will not otherwise be profitably used, markets can be better supplied from local supplies if the potatoes are sold gradually, according to market requirements.[1]

The change in price of the late crop is indicated by jobber prices at Boston averaged for the 18 years 1929 to 1947-48[2] as shown in Fig. 1.

Prices tend to increase up to January, then level off.

A sample survey of growers in New Hampshire showed that 26 out of 49 had storage capacity in excess of their 1949 crop. Most growers of below 1100 bushels had adequate storage facilities; of 19 with crops between 1400 and 7500 bushels, 9 only had sufficient storage capacity. There was no measure of the quality of the storage.

To retain local markets for local growers, holding supplies either on the farm or in local storage for sale during the year will more nearly meet trade and consumer requirements, provided quality is maintained.[3] The establishment of contracts or trade connections will reduce the risk of storage and it is the responsibility of individual growers or groups of growers to establish these relationships. Interviews with retailers and wholesalers revealed that one of the major factors influencing their decisions as to where to buy was the regularity of supplies through the year. Retailers wanted their weekly supply delivered regularly, irrespective of the source and, in many cases, shifted this responsibility to the wholesaler. The wholesaler, in turn, was influenced by the regularity with which he could take deliveries and the highly organized Maine producers offered this service.

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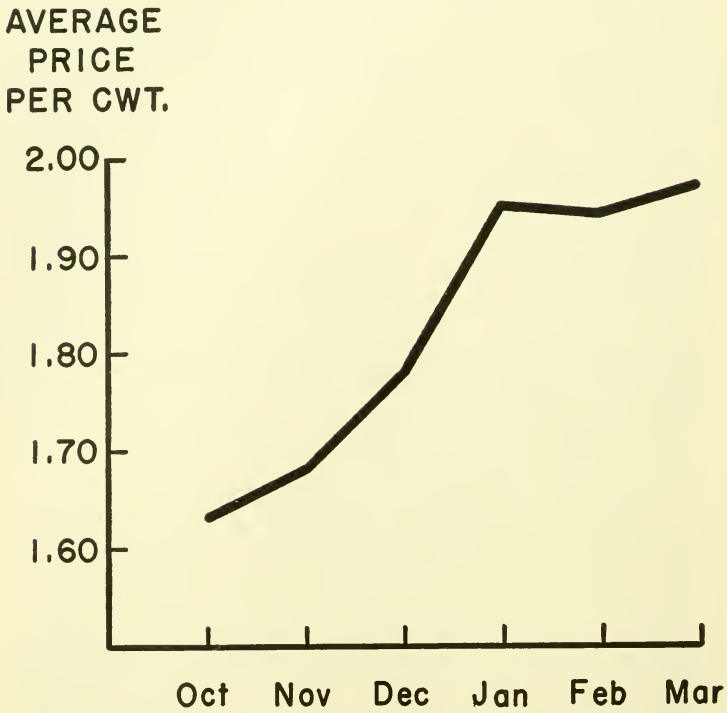
[1]For methods of farm storage, see *Potato Storage* (U. S. Department of Agriculture Farmers Bulletin 1896.

[2]*Maine Potatoes* (U. S. Department of Agriculture and Maine Division of Markets.)

[3]The predominate rate of turnover among retailers is once or twice a week. Few retailers have storage facilities or show any preference for adopting the storage function.

Fig. 1. Seasonal Changes in Average Jobber Prices at Boston for Years 1929 to 1948 by Months.



CONCLUSIONS

The acreage in potatoes in New Hampshire is declining and while there is no statistical evidence to this effect, the greatest decline appears to be with the small commercial growers. The decline has been greater in the northern counties, and a relative increase was apparent in some southern counties.

Large areas of the southern and eastern part of the state are predominately served by wholesalers from both New Hampshire and Maine. These wholesalers procure their supplies where they can maximize their net returns. The lower priced and graded quality of Maine potatoes has been an attractive source of supply. Carlot deliveries can be obtained at a lower unit price, a fact which again delimits the source of supply to large growers or central supply depots.

Rail rates have shifted so that Maine potatoes can be shipped to southern New Hampshire markets at a cheaper mileage cost than from northern

New Hampshire producing areas. This has increased the advantage of Maine potatoes shipped by rail on the southern markets. To the extent that similar trucking facilities are adopted by the two areas this advantage is eliminated; but such considerations must influence the most profitable location of production in relation to markets within the state if rail shipments are adopted.

New Hampshire prices exceeded Boston wholesale prices in Concord, Keene, and Portsmouth in 1949. Using carlot rates from Boston as transportation charges, there was a definite advantage for Keene district wholesalers to buy on the Boston or Massachusetts markets in preference to the prevailing announced local market price. It was equally profitable for Portsmouth district wholesalers to buy in Boston as from local producers, so that quality and reliability of supply would influence their decisions.

A lower government support price for Maine potatoes relative to New Hampshire increased the competitive advantage of Maine potatoes on local markets, a condition which may have longer run effects on relations between local producers and near-by markets, particularly where local growers have preferred to sell to the government.

The complaints of wholesalers and retailers about New Hampshire grades, appearance, and quality appear directed at the smaller producers who unload their crops at digging time without use of a sorting table. This seasonal marketing has the effect of overloading the markets for a short period, with a consequent reduction in price and perhaps a bad advertisement for local produce. Producers with storage facilities attempt to even out their supplies during the year. This regularity of supply is a major factor in the decisions of wholesalers, retailers, and hotel trade as to where to buy their potatoes.

The use of potatoes as credit at the local store has given way to a more highly organized competitive industry requiring standard quality, evenness of supply through the year and attractive packs at a price which will pay returns to the handler. The government support prices may have protected small growers from bearing the full consequences of poor grading and careless harvesting, but pressure from Maine commerical growers is making the job for local growers more and more one of increasing efficiency if these local markets are to be retained.

To meet this competition growers might benefit from centralized marketing and grading. The scattered location of producers should not prevent regional storage houses either co-operatively owned or owned by larger growers with the available storage capacity, from consolidating supplies and risk. The benefit to growers would come through re-established trade outlets by quality guarantees, regular marketing, and centralized price manipulation to meet competition.

The responsibility for such an organization rests with producers. The Agricultural Services Inc., or Merrimack Farmers Exchange are organizations which could expand their facilities and services to meet the needs of producers in marketing. Unless such measures are taken the New Hampshire potato industry as a source of local market supplies can be expected to decline under the increased competition for a falling consumer market.